# MANAGEMENT STRATEGIES FOR CRITICAL AREAS

## SUITLAND BOG

JUNE 1984

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## SUMMARY

This report contains a detailed evaluation of the Suitland Bog and its surrounding area including its natural values and sensitivity to impacts from present and future activities within the study area. The evaluation includes potential impacts due to direct encroachment by incompatible land uses, sedimentation and the alteration of surface and groundwater flow patterns. The study indicates concerns in each of these areas. Serious future problems may result from decreases in groundwater flow to the bog, increases in surface water flooding of the bog and sedimentation due to surface flooding. To address the concerns identified in the study, a series of recommended actions is proposed.

## 1.0 INTRODUCTION

This report contains the evaluation of the Suitland Bog including its wildlife values, sensitivity to impacts and a management strategy for its protection.

### 1.1 Background

The Department of State Planning's enabling legislation, Article 88C, requires designation of Areas of Critical State Concern, after consultation with and consideration of, recommendations submitted by local governments. An Area of Critical State Concern has been defined by the State as a specific geographic area of the State which, based on studies of physical, social, economic and governmental conditions and trends is demonstrated to be so unusual or significant to the State that the Secretary of State Planning designates it for special management attention to assure the preservation, conservation, or utilization of its special values. The legislation also empowers the Department to promulgate guidelines for use by local subdivisions in making critical area recommendations. These guidelines were published in the Maryland Register on January 7, 1976. In response to these guidelines, Prince George's County in March 1977 published a list of twelve areas recommended for consideration as an "Area of Critical State Concern". Included on the list was the Suitland Bog, which was identified as critical due to the unique and fragile nature of the plant community located in the Bog.

In January 1981, the Maryland Department of State Planning (DSP) published a report entitled, "Areas of Critical State Concern Designation Report" (Reference 1). This report includes the initial areas designated in accordance with Article 88C. Among the areas designated was the Suitland Bog in Prince George's County. In making

these designations, the DSP indicated the intention that State and local governments:

- Adopt designated critical areas as part of local comprehensive and other plans and incorporate them within the overall local planning program of each local jurisdiction.

- Assure that zoning, subdivision, growth management and other decisions are consistent with critical area designations and where required, appropriate plans are amended.

- Conduct an annual assessment to ascertain the impact of decisions and actions on the designated areas and include the results in the planning agency's annual report.

- Assure that sewer, water, transportation and other facility and utility actions are consistent with the critical areas.

- Assist in defining new generic classes and make recommendations of areas within each added class.

## 1.2 Authorization

This study was prepared in accordance with Contract No. C4-78-440(83) between the State of Maryland, Department of Natural Resources, Tidewater Administration, Coastal Resources Division and the Maryland-National Capital Park and Planning Commission representing Prince George's County.

## 1.3 Purpose

The purpose of this study is to evaluate present and future problems affecting the Suitland Bog and prepare management recommendations for its future protection. The report responds to the actions recommended by the Department of State Planning in the Areas of Critical State Concern Designation Report.

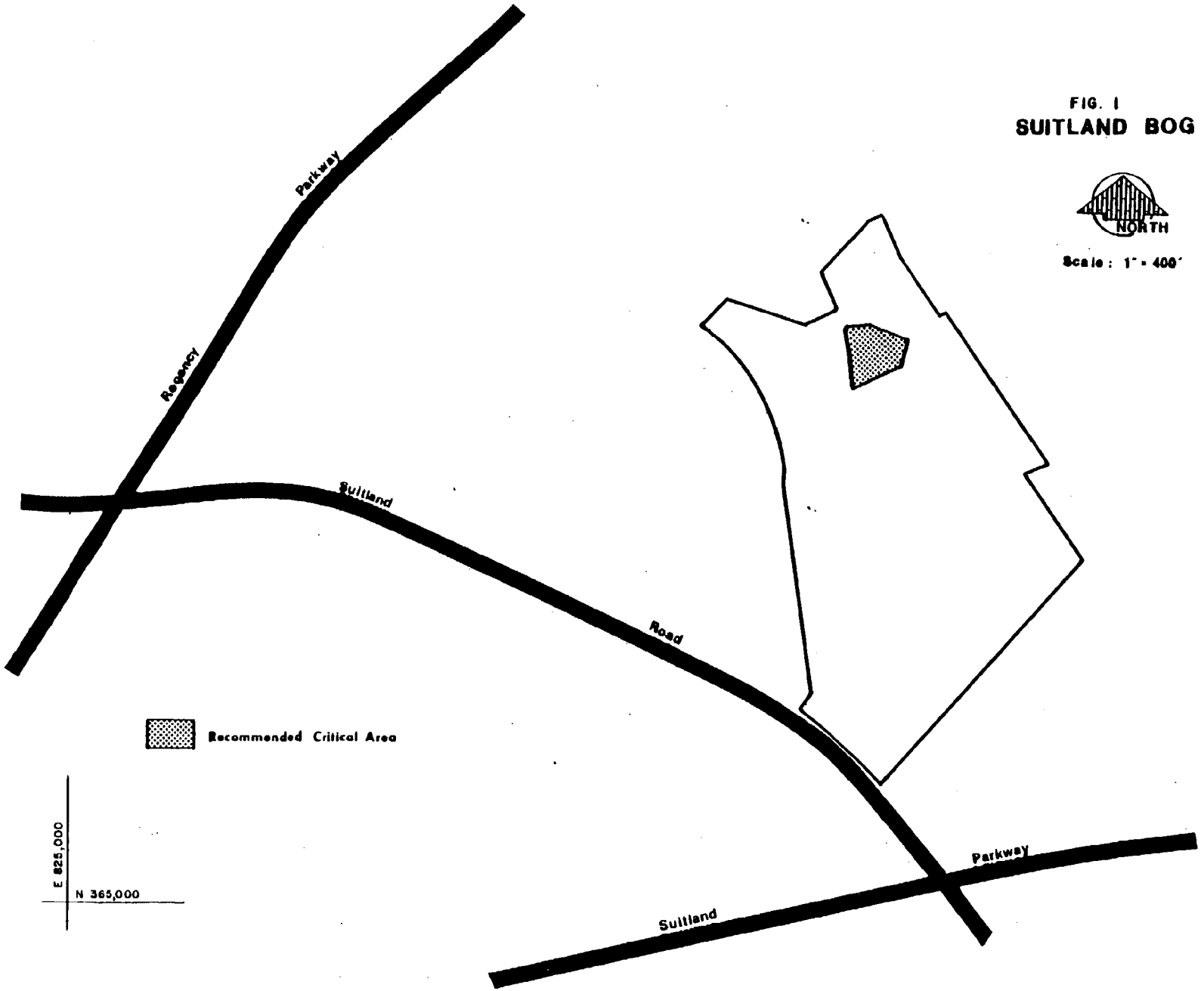
## 2.0 NATURAL VALUES

The Suitland Bog is a small remnant of the Magnolia Virginia Bogs which were once much more extensive in the region. Of the 30 bogs once known to exist in the Washington area, only the Suitland Bog remains. The Suitland Bog is valued by botanists and ecologists because it provides the habitat for a number of unusual species of vegetation including Sphagnum sp. and several varieties of insectivorous plants such as the common pitcher, Sarracenia purpurea, and the dew-thread, Drosera filiformis. In the past, the Bog vegetation also included three very rare plants, Arethusa bulbosa, Habenaria blephraglottis, and Melanthium virginicum. The following is a list of additional noteworthy plant species which still occur at the bog (Reference 2):

Bog clubmoss (Lycopodium inundatum)
Bog panic grass (Panicum lucidum)
Virginia cottongrass (Eriophorum virginicum)
White beak-rush (Rhynchospora alba)
Umbrella grass (Fuirena squarrosa)
Carolina yellow-eyed grass (Xyris caroliniana)
Ten-angled pipewort (Ericaulon decangulare)
Snake mouth or Rosepink (Pogonia ophioglossoides)
Swamp magnolia or Sweetbay (Magnolia virginiana)
Intermediate-leaved sundew (Drosera intermedia)
Black chokeberry (Aronia melanocarpa)
Swamp service-berry or shad-bush (Amelanchier canadensis)
Swamp milkwort (Polygala cruciata)
Virginia meadow beauty (Rhexia virginica)
Clammy azalea (Rhododendron viscosum)
Sheep Laurel (Kalmia angustifolia)
Bladderwort (Utricularia sublata)

Collins' carex (Carex collinsii)
Poison sumax (Rhus vernix)
Dwarf huckleberry (Gaylussacia dumosa)
Crawfords' ragwort or groundsel (Senecio crawfordii)
Marsh goldenrod (Solidago uliginosa)

FIG. 1
**SUITLAND BOG**



## 3.0 STUDY AREA DESCRIPTION

The Suitland Bog is located in south central Prince George's County in the northeastern quadrant of the intersection of Suitland Parkway and Suitland Road (Figure 1). It is situated at the north end of a 24-acre parcel owned by the Maryland-National Capital Park and Planning Commission (M-NCPPC). In order to evaluate potential impacts on the Bog, a study area was defined which consists of parcels contiguous to the Bog and the area draining into the Bog. This study area as shown in Figure 2 is approximately 125 acres in size.

### 3.1 Land Use

The primary land use within the Bog area is vacant idle land. The Bog itself is part of a 24-acre parcel owned by M-NCPPC. This site is to be developed in recreational uses; however, current usage consists only of natural interpretation of the Bog vegetation. Vacant parcels to the north and east of the park site were formerly mined for sand and gravel. These areas were only partly reclaimed and have sparse vegetation in many places. Other existing land uses within the study area consist of single family detached development to the west of the Bog and single family attached development northeast of the Bog. The development of attached dwelling units is ongoing with active construction. Table 1 provides a breakdown of existing land use. The location of these uses is shown in Figure 3.

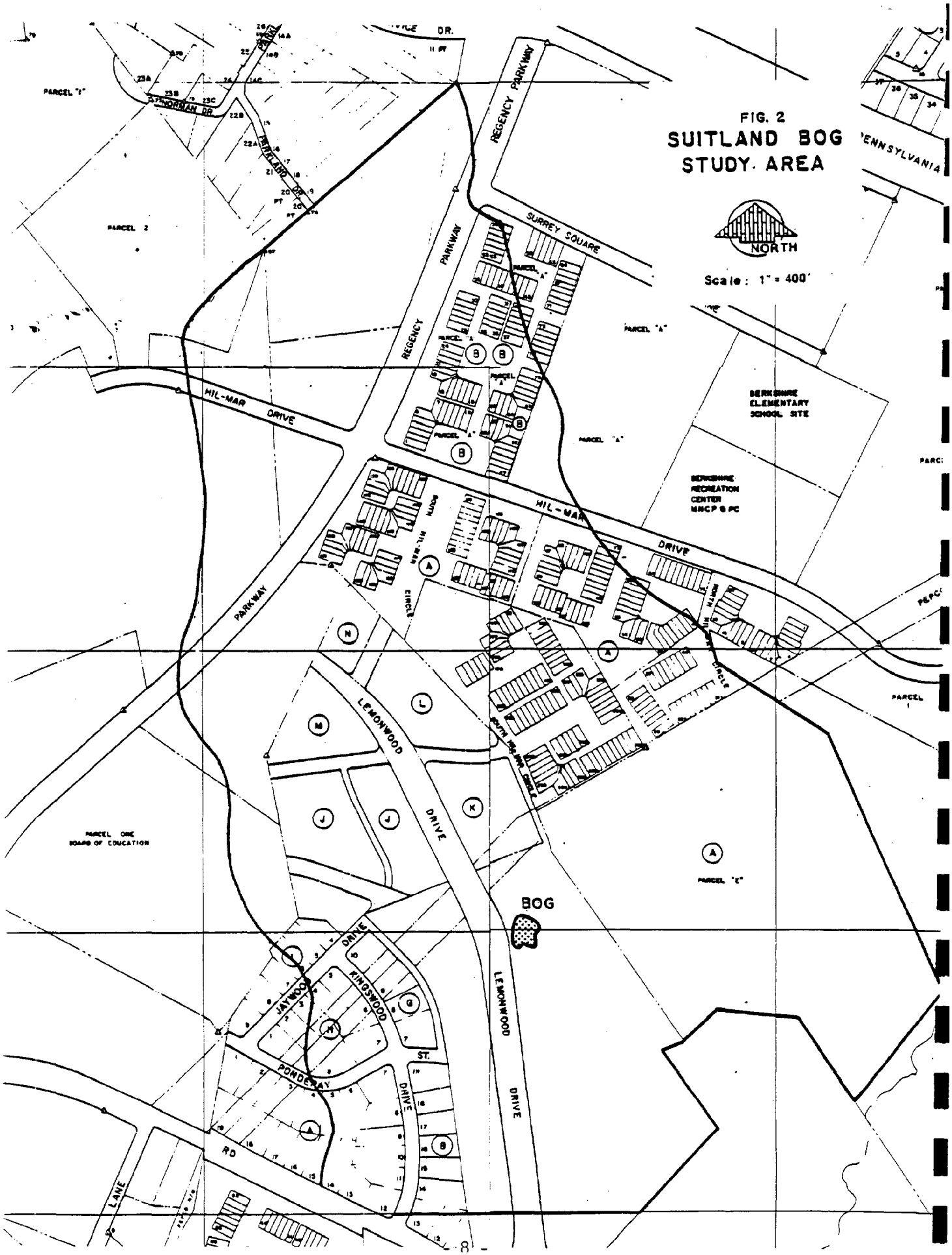


FIG. 2
SUITLAND BOG
STUDY AREA
NORTH
Scale: 1" = 400'
REGENCY PARKWAY
SURREY SQUARE
HIL-MAR DRIVE
BERKSHIRE ELEMENTARY SCHOOL SITE
BERKSHIRE RECREATION CENTER M-NCP & PC
PARCEL "A"
PARCEL "E"
PARCEL ONE BOARD OF EDUCATION
LEMONWOOD DRIVE
BOG
JAYWOOD DRIVE
KINGSWOOD ST.
PONDERAY DRIVE
LANE RD

FIG. 3

# EXISTING LAND USE

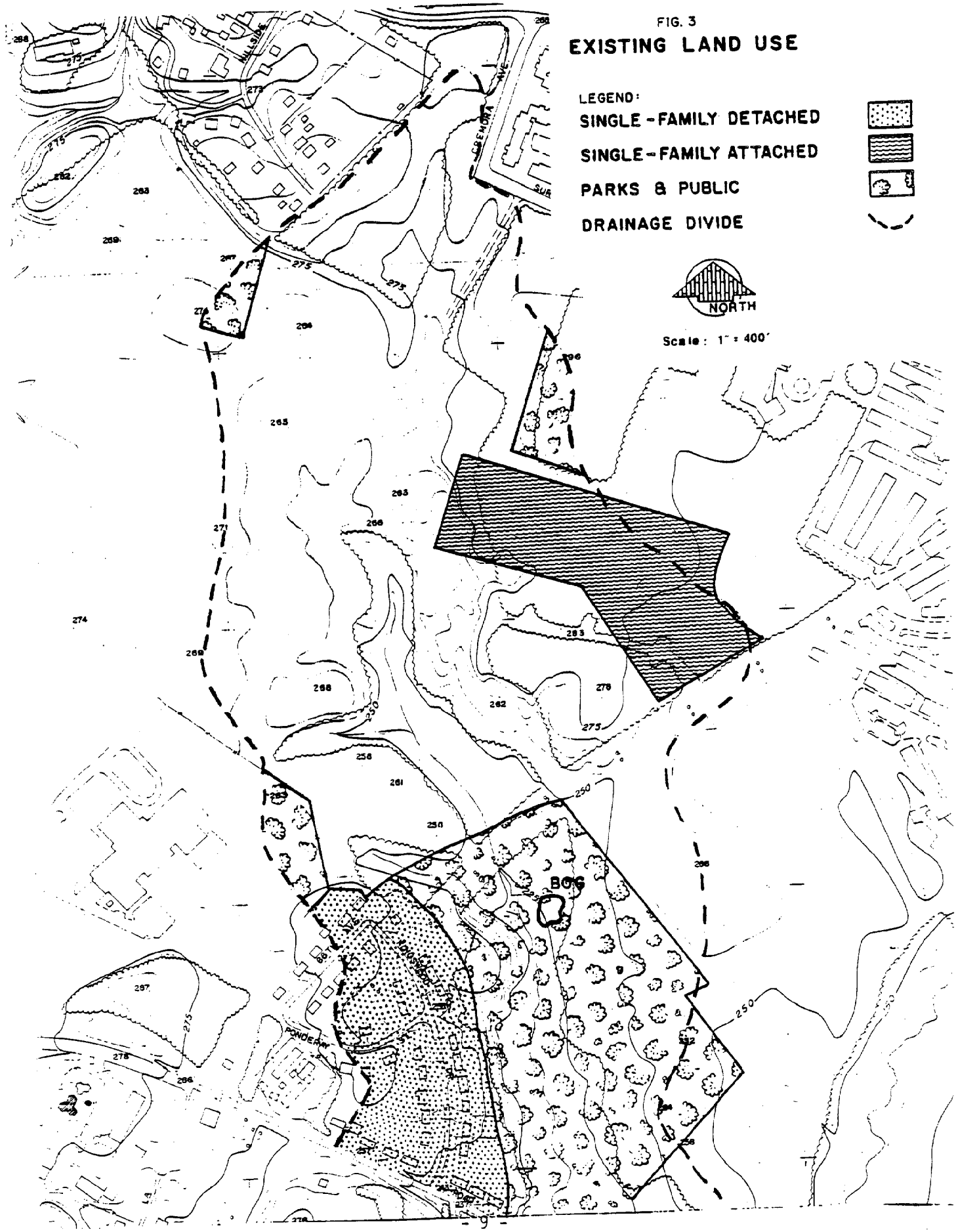


Table 1

LAND USE SUITLAND BOG STUDY AREA

| Land Use | Acreage |
|---|---|
| Single Family Detached | 10.0 |
| Single Family Attached | 6.0 |
| Public Use | 23.0 |
| Vacant | 86.0 |

Zoning within the bog study area consists of 72 acres single family detached (R-R, R-80) and 53 acres of single family attached (R-T). Future land use within the study area is currently being evaluated through the Suitland-District Heights Master Plan which will be completed during FY 1984. The Draft Preliminary Master Plan recommends a combination of single family detached and attached uses within the study area. This recommendation is generally consistent with the existing zoning except for a 26-acre parcel which abuts the eastern bundary of the bog site. This parcel is recommended for downzoning from single family attached uses (R-T) to single family detached uses (R-80). The plan also recommends the acquisition of an additional 16 acres in the watershed above the Bog. The proposed land use recommendation is shown in Figure 4.

3.2 Soils and Slopes

The Soil Survey for Prince George's County (Reference 3) contains a detailed mapping and description of soils found in the study area. Four soil series predominate within the study area: Beltsville series, Aura series, Sassafras series and the Bibb series. The Beltsville soils are found in the upland areas of the site and consist of deep moderately well drained silt loams. The Beltsville soils are highly erodible with "K" factor of 0.43. The

FIG. 4

# PLANNED LAND USE

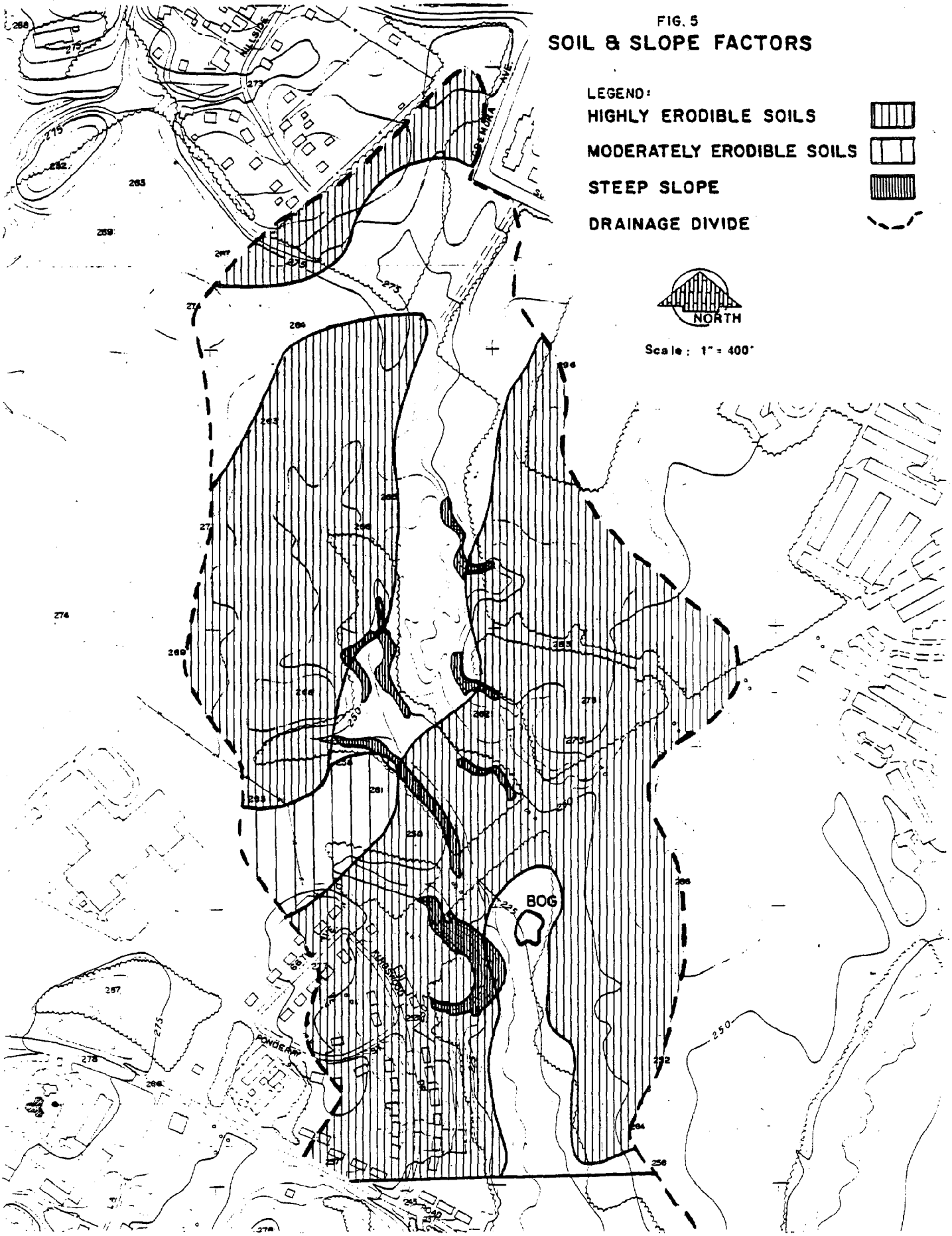
soil erodibility or "K" factor is a factor included in the Universal Soil Loss equation to represent the natural potential of a soil to erode. Values of "K" in Maryland range from 0.17 to 0.49 (Reference 4). The Aura soils occur within the study area on slopes extending from the upland to low lying areas. These soils are also highly erodible (K = 0.43) and because they occur on sloping land they are subject to severe erosion. Sassafras soils are found in the northern portion of the study area. These deep well-drained soils have low to moderate potential for erosion. Finally, the Bibb soils consist of poorly drained level to nearly level soils on flood plains. Bibb soils which are found along the streams within the site, have a low erosion potential. The Bog itself is located on Bibb soils. It should be noted that in many portions of the study area, the Beltsville and Aura soils have been disrupted by prior mining activities and the soil survey identifies a portion of the study area as a gravel pit. The topography of the site consists of upland areas bisected by a stream flowing north to south. A maximum elevation of 285 feet (msl) occurs at the northernmost portion of the site with a minimum elevation of 200 feet near the bog representing an average slope of 2%. Slopes exceeding 20% occur primarily as the stream valley walls to the west and north of the Bog. Mining operations to the east of the Bog study area have left a mound 10 to 15 feet high with steeply sloping sides. Figure 5 identifies the location of highly erodible soils and steep slopes within the study area.

### 3.3 Surface Water Drainage

The Suitland Bog is located adjacent to a small stream which flows from north to south along the western boundary of the Bog. The watershed of this stream above the Bog is approximately 80 acres in size accounting for a major portion of the study area. Although 87% of the watershed is currently vacant, 40% of the vacant land shows evidence of previous disturbance by mining activities. As a result, the stream has been subject to heavy siltation in the vicinity of the Bog.

FIG. 5

## SOIL & SLOPE FACTORS



## 3.4 Ground Water

The Suitland Bog owes its existence to an unusual resurgence of ground water which provides a constant flow of water into and through the Bog. Because the Suitland Bog is dependent on ground water, a geohydrologic study was conducted in 1978 to identify the Bog's recharge area (Reference 5). This study found that in the vicinity of the Bog, soil materials from the surface to a depth corresponding to an elevation of 230 feet (m.s.l.) are gravels and sands mixed with clay. Below 230 feet is a layer that is principally sand. The elevation of 230 feet corresponds with the elevation of seeps feeding the Bog indicating that the sand layer is the aquifer supplying water to the Bog. Piezometric data from nineteen observation wells were collected for the period May 25, 1977 to March 3, 1978. The monthly values of the data indicate a gradual decrease in the elevation of the water table from piezometer 4 to peizometers 12 and 17 and seep 5 (Figure 6). The piezometric head profile indicates water is moving from near the hilltop down toward the Bog and is being drained by the seeps in the Bog and those surrounding the area. This water table configuration is commonly called a ground water mound. Based upon data for all observation wells, contours of equal piezometric head were mapped (Figure 7). Figure 7 demonstrates that the crest of the ground water mound is approximately 450 feet east of the Bog.

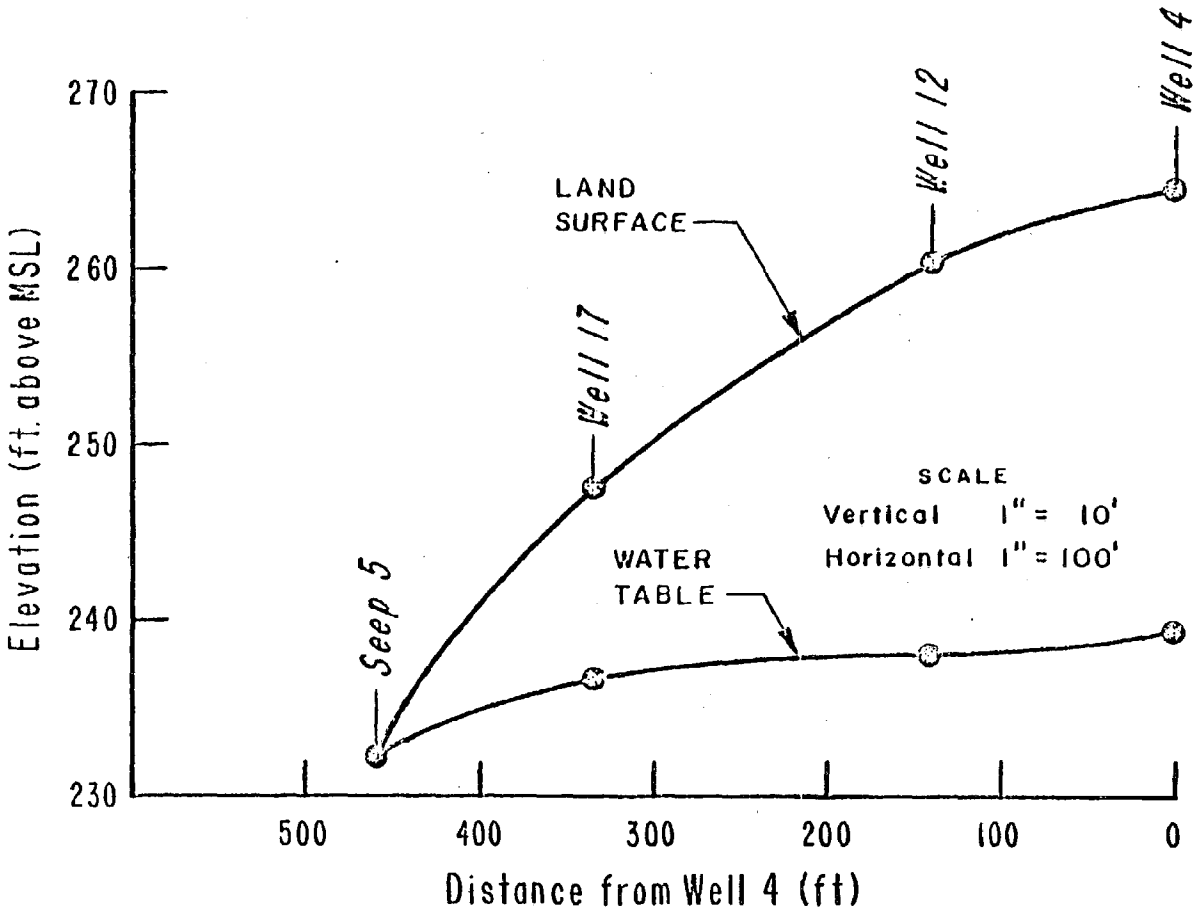



Figure 6. Cross section showing land surface and piezometric head (water table) profiles up slope from the Suitland Bog

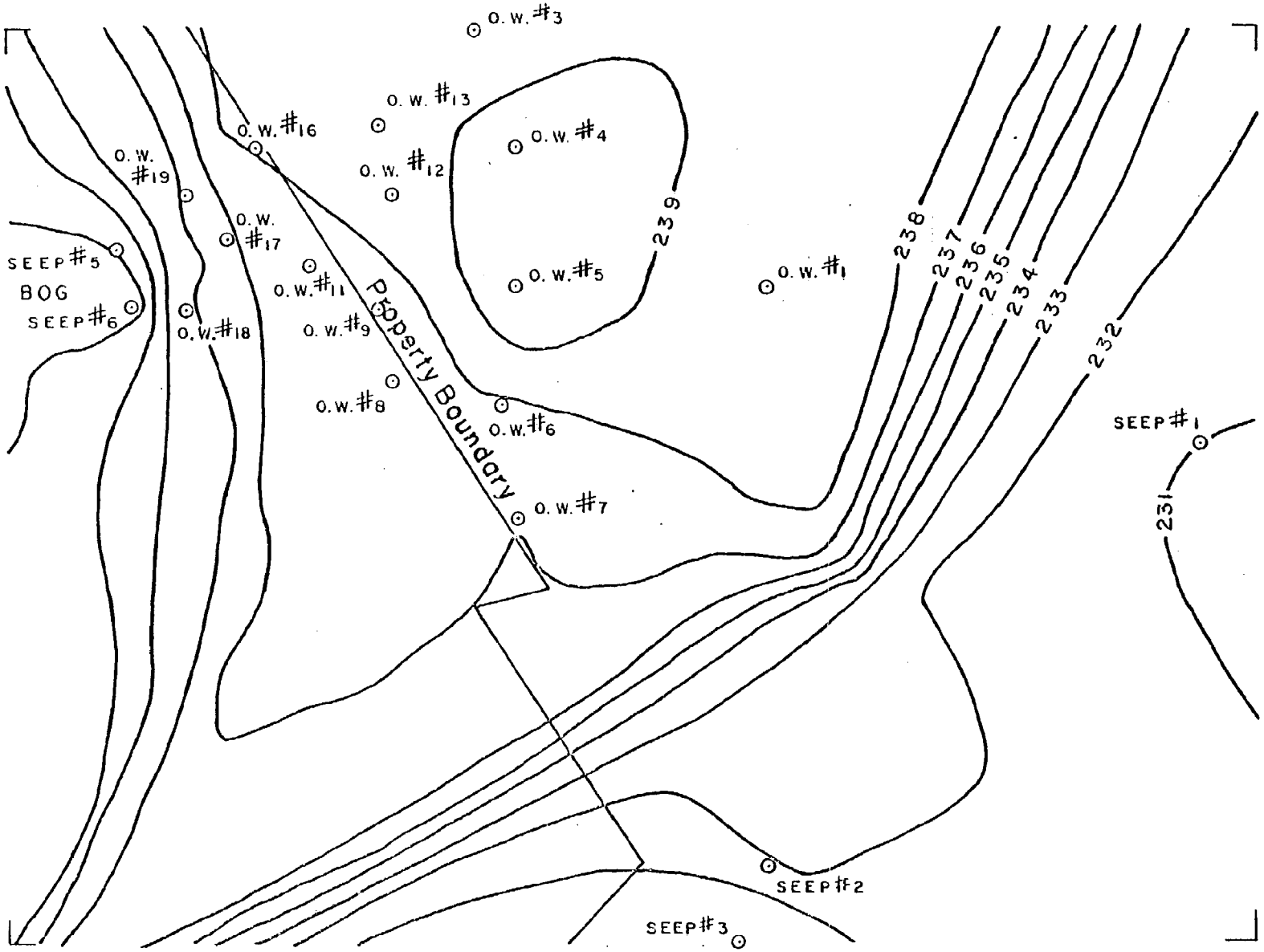



Figure 7. Piezometric head map of piezometer network and adjacent area for May 25, 1977

Approx. scale 1" = 150'

## 4.0 PROBLEM IDENTIFICATION

As with any wetland, the three most important impacts which could affect Suitland Bog are:

- Direct encroachment causing habitat loss
- Sedimentation
- Alteration of surface and/or ground water flow patterns

Each of these types of impacts must be evaluated to determine management needs for the Bog.

### 4.1 Direct Encroachment

Any direct encroachment on the Bog by competing land uses has been prevented through the public purchase of the bog in 1975 by the Maryland-National Capital Park and Planning Commission (M-NCPPC) as part of a 24-acre site. Soon after the purchase, the Bog area was fenced in for security and a board walk was constructed through the Bog to allow observation of plantlife without damaging the fragile ecosystem. Recent observation indicates a permanent opening has been cut in the fence so it no longer serves its intended purpose; however, no direct impacts on the Bog were observed due to this breach of security. The publicly owned site containing the Bog and adjacent privately owned sites are apparently used for illegal dumping of trash and debris. Several piles of used tires, roofing materials and old appliances have been observed. While this dumping activity is not likely to harm the Bog itself, it certainly detracts from the aesthetics of the area and encourages further dumping.

## 4.2 Sediment

Since the Suitland Bog was first brought to the attention of County officials in the early 1970's, sediment has been recognized as a major concern and the biggest existing threat to the Bog. A 1970 report in the Atlantic Naturalist (Reference 6) noted that a considerable area of the Bog had already been buried by sand and silt, and that trees and shrubs which form a protective canopy over the Bog were also suffering from siltation. A field survey conducted by the Maryland Coastal Zone Management Program in 1976 (Reference 7) also noted heavy siltation of the flood plain. Recognizing the importance of preventing sediment from reaching the Bog, considerable effort has been expended by the M-NCPPC to stabilize slopes and provide erosion and sediment controls along the eastern perimeter of the Bog. These controls which were installed in 1977 consist of check dams, berms, and swales to divert runoff around the Bog. A recent examination of the Bog indicates that the sediment controls are working very well in preventing the direct influx of sediment from the denuded area to the east. There remains a concern for the occasional influx of sediment carried by flood waters in the stream on the western side of the site. A detailed flood plain study has not been conducted to determine the frequency and extent with which flood waters may impact the Bog, particularly under future development conditions. The bottomland forest which shades the Bog has already been heavily impacted by siltation from the stream. Much of the sediment deposited in this area originates from upland areas to the north of the Bog, where highly erodible soils have been disturbed by mining activity. If these areas develop into single family residential uses, as currently planned, care should be taken to stabilize the area and reduce erosion.

## 4.3 Alteration of Surface and Ground Water Flow Patterns

As discussed previously, the development of the Suitland Bog is due to a resurgence of ground water. Without this continuous supply of water, the Bog will be destroyed. The ground water which feeds the Bog is the result of infiltration and percolation of water in the upland area centered about 450 feet east of the Bog. The area with the highest elevation provides the best opportunity for storage since this permits the largest ground water mound to be developed. Any activity which impedes infiltration in this area will adversely affect the supply of water to the Bog. Because the identified recharge area is part of a 26-acre privately owned tract of land, a request for development is likely.

While a decrease in ground water flow will destroy Suitland Bog, an increase in surface runoff may also adversely impact the Bog. As discussed in the section on sediment problems, much of the runoff originating to the east is diverted around the bog by means of artificial swales and berms. Any development to the east should avoid increasing the runoff into this drainage system. The stream on the west side of the Bog is also sensitive to increased volume of flow. Approximately 87% of the watershed to the north of the Bog and draining into this stream is currently undeveloped. Plans for this area indicate that development will occur as single family detached and attached dwelling units. Increased runoff from these areas could cause increased flooding downstream and potentially impact the Bog.

## 5.0 MANAGEMENT STRATEGY

A considerable amount of time and money has already been expended by Prince George's County and the Maryland-National Capital Park and Planning Commission to protect and preserve the natural values of the Suitland Bog. The public purchase of the Bog site and the installation of erosion controls and security measures have saved the Bog from immediate destruction and provided the opportunity for recovery of the Bog environment. Additional measures are needed, however, to assure the future protection of the Bog. Based upon the evaluation of potential impacts, major concerns occur in the areas of sediment control, alteration of surface and ground water flow patterns and Bog security. As the owner and direct protector of the Bog, the M-NCPPC, through the Department of Parks and Recreation, must continue to take a lead role in assuring the continued vitality of the Bog. The Parks Department, however, cannot accomplish this task alone. Continued support is needed from other State and County agencies and especially from the general public. With this in mind, the following management strategies are recommended:

### Sediment Control

- To assure that the existing system of diversion dikes and drainage swales continues to protect the Bog from sheet and rill erosion originating to the east, it is recommended that the Parks Department implement an annual inspection and repair program.

- Reclamation of the abandoned sand and gravel mines to the east and north of the bog should be accelerated. To encourage this action it is recommended that the State Department of Natural Resources consider revising the rules for use of

the Surface Mined Land Reclamation Fund to allow the issuance of low interest loans to reclaim privately owned sites.

- Any additional land acquired for public use should be immediately evaluated for potential use of Surface Mined Land Reclamation Funds.

- It is recommended that the Planning Board require the submission of a sediment control concept study and approval thereof by the Soil Conservation District prior to any final plat approval within the study area.

- The existing sediment control program should be vigorously enforced for any development within the Bog study area.

Surface Flow Alteration

Increased flow in the stream along the western boundary of the property could significantly impact the Bog. The potential for such increases is great since a large proportion of the contributing drainage basin is currently undeveloped. To protect the Bog from future increases in flooding and subsequent sedimentation, it is recommended that:

- A flood plain study be conducted for present and future conditions to establish the frequency and level of potential impacts on the Bog.

- The County vigorously pursue the acquisition of additional land in the watershed above the Bog. Of particular concern is the area containing the defined stream channel and steeply sloped valley walls.

- The State DNR consider the above acquisition as a priority for funding under Program Open Space.

- If acquisition prior to development is not possible, a minimum 100 foot buffer should be required adjacent to the stream.

- All new developments within the drainage area above the bog should be required to provide storm water management measures which reduce post development peak flows to predevelopment levels.

Ground Water Flow Alteration

A detailed hydrogeologic analysis of the Bog area clearly indicates that the source of water to the Bog is located in an area approximately 450 feet to the east. A portion of this area is currently privately owned. To protect the water supply for the Bog it is recommended that:

- The defined recharge area be protected from development either through acquisition or inclusion as private open space within a development proposal.

- Sensitive site planning be encouraged in areas adjacent to the recharge area which promotes infiltration through the use of natural drainage, contour landscaping, dutch drains, porous or permeable pavement, grass lined swales and infiltration pits and trenches.

Bog Security

Security of the Bog site can best be accomplished through public education and the overall cleanup and development of the site for park and recreational uses. The current appearance of the site as an abandoned gravel mine and 24-hour access encourages its use as a dumping ground. To remedy this situation it is recommended that:

- The Park Department complete development plans for the bog which includes a thorough cleanup of the site.
- Restrict vehicle access to the site when not attended by Park department personnel.
- Repair the fence around the bog to restrict access when the site is not attended by Park Department personnel.

## REFERENCES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